Planning Community of Practice
Crowne Plaza Hotel
San Antonio, TX
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Actions for Change Theme 1: Comprehensive Systems Approach Overview

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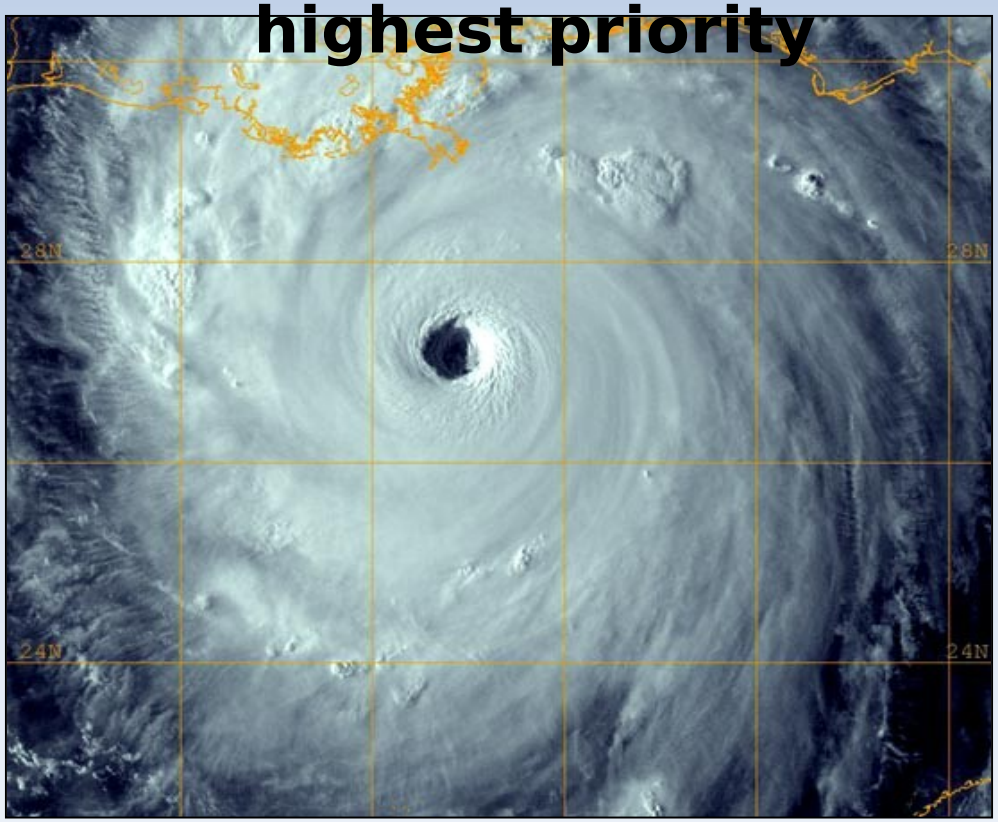
ACTIONS for CHANGE

Deterministic, project-based, with NED as highest priority



Risk-based comprehensive system approach to integrated water resources management with public safety as highest priority

ACTIONS for CHANGE

Actions for Change
Bottom Line Up Front

"The Corps is responsible for the projects we build and manage, and we are accountable to the American people ….. for those who doubt us, words alone will not restore confidence. We are mindful that the public trust is earned when we follow through on our actions."

– Lieutenant General Carl A. Strock

ACTIONS for CHANGE

Chief's 12 Actions ⇒ 4 Themes

Theme 1 - Comprehensive Systems Approach

- Action 1 - Employ integrated, comprehensive and systems-based approach
- Action 5 - Employ adaptive planning and engineering systems
- Action 6 - Focus on sustainability

Theme 2 - Risk Informed Decision Making

- Action 2 - Employ risk-based concepts in planning, design, construction, operations, and major maintenance
- Action 7 - Review and inspect completed works

Theme 3 - Communication of Risk to the Public

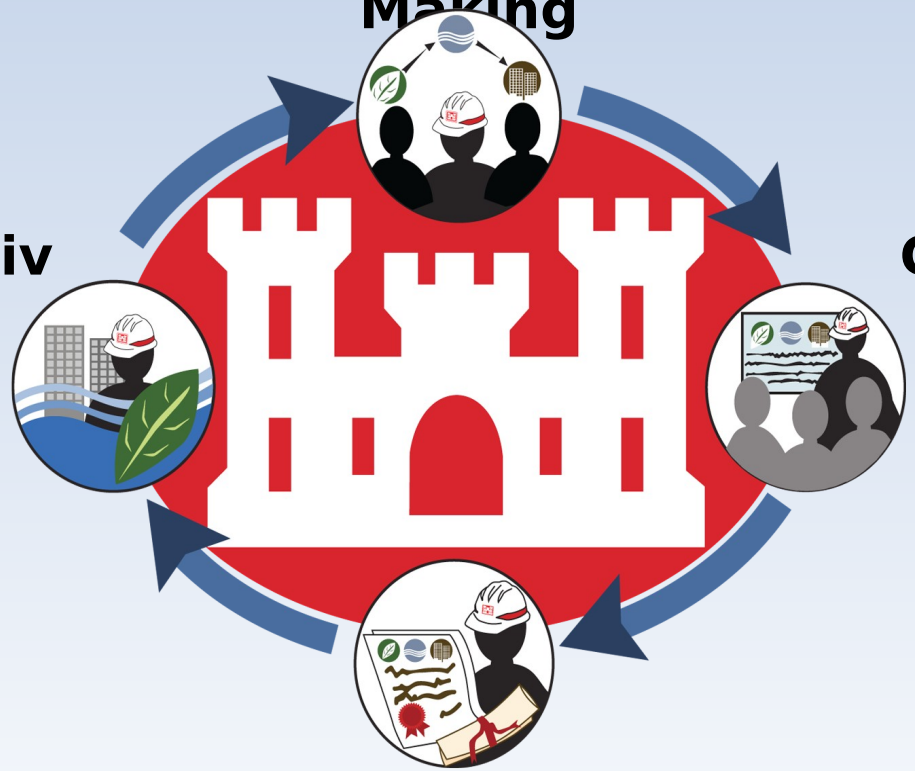
- Action 9 - Effectively communicate risk
- Action 10 - Establish public involvement risk reduction strategies

Theme 4 - Professional and Technical Expertise

- Action 3 - Continuously reassess and update policy for program development, planning guidance, design and construction standards
- Action 4 - Employ dynamic independent review
- Action 8 - Assess and modify organizational behavior
- Action 11 - Manage and enhance technical expertise and professionalism
- Action 12 – Invest in research

ACTIONS for CHANGE

USACE Actions for Change


Risk Informed Decision Making
Communication of Risk to the Public
Professional and Technical Expertise
Comprehensive Systems Approach

ACTIONS for CHANGE

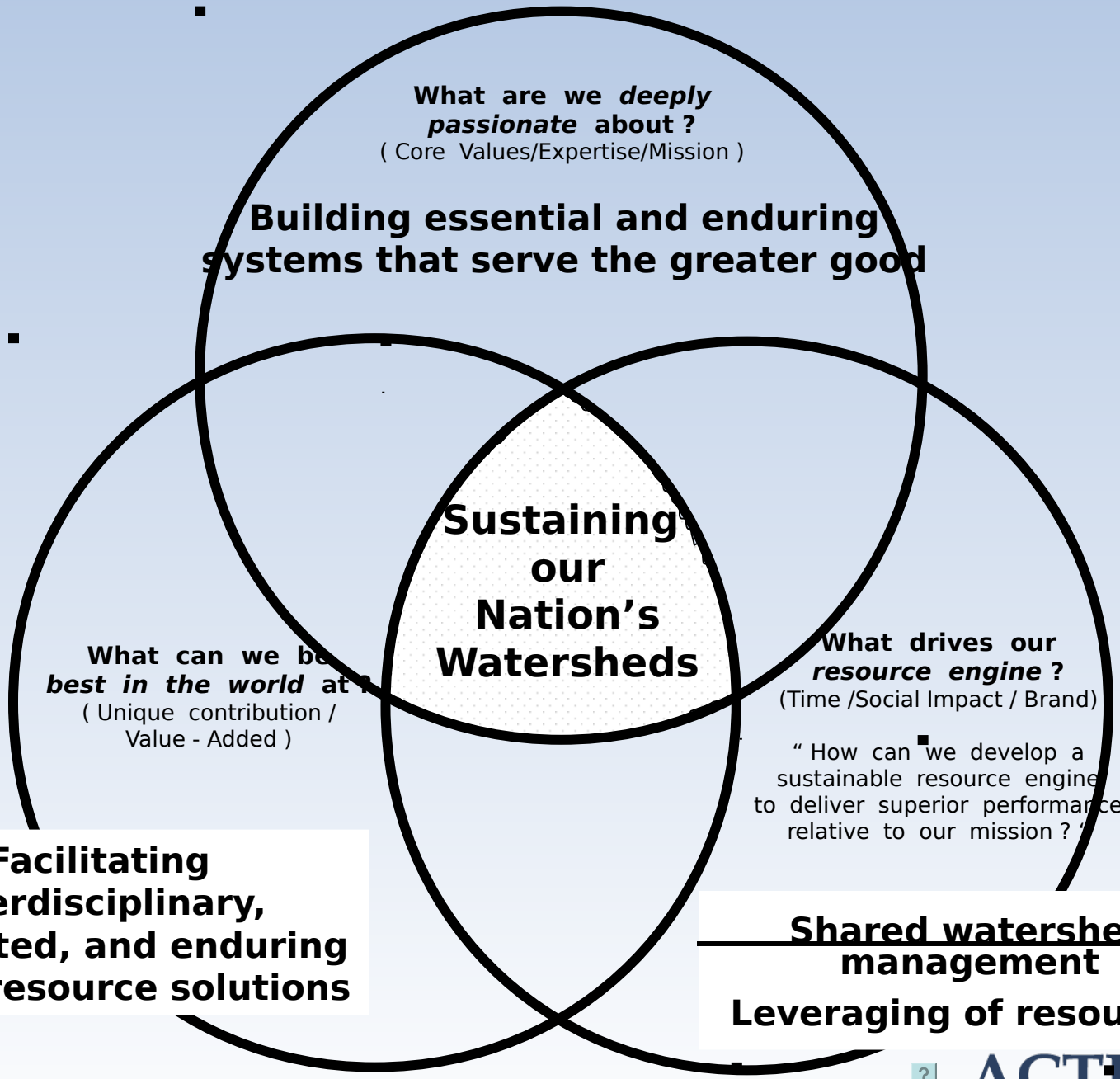
Makeup of the National Teams

- **Multidisciplinary & cross-functional**
- **USACE-wide participation**
- **Representation external to the Corps**
- **Include R&D**
- **CoP leads**
- **Include next generation of Corps**
- **Leads for pilot projects or existing efforts that can provide leveraging**
- **Active participants from other linked activities (e.g., Flood Risk Management Program)**
- **Enthusiastic Corps staff!**

AEC Comprehensive Systems Approach Mission

- **To effect fundamental change in the US Army Corps of Engineers (USACE)**
- **Develop and implement an integrated, comprehensive and systems based approach in the execution of all its mission areas**
  - **Incorporate anticipatory management to remain adaptable and sustainable over time**
  - **Placing the highest priority on protection of public health and safety**
  - **Consistent with the Corps Environmental Operating Principles**

ACTIONS for CHANGE

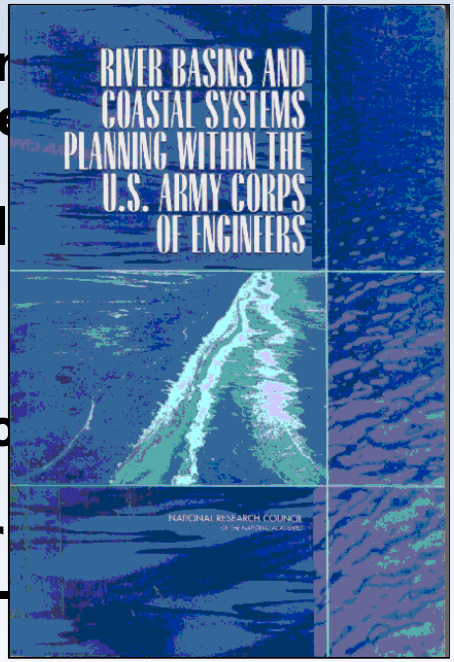

What are we *deeply passionate* about ?
(Core Values/Expertise/Mission)
Building essential and enduring systems that serve the greater good
Sustaining our Nation's Watersheds
What can we be *best in the world* at ?
(Unique contribution / Value - Added)
What drives our *resource engine* ?
(Time /Social Impact / Brand)
" How can we develop a sustainable resource engine to deliver superior performance relative to our mission ? "
Facilitating interdisciplinary, integrated, and enduring water resource solutions
Shared watershed management
Leveraging of resources

ACTIONS for CHANGE

After COL Dornstauder

AFC Comprehensive Systems Approach

- **What is a system?**
  - **A dynamic and complex whole interacting as a structured functional unit**
- **What is a comprehensive systems approach?**
  - **A multidisciplinary, multi-objective, and multi-stakeholder framework supportin "a balanced evaluation of all re issues (e.g., hydrologic, geomorphic, ecologic, social economic)" (NRC 2004, p. 19)**
- **Corps-specific context?**
  - **Shifting the focus on making decisions fro individual, isolated projects to an interdependent system, and from local or immediate solutions to regional or long- solutions, at appropriate scales of space and time**

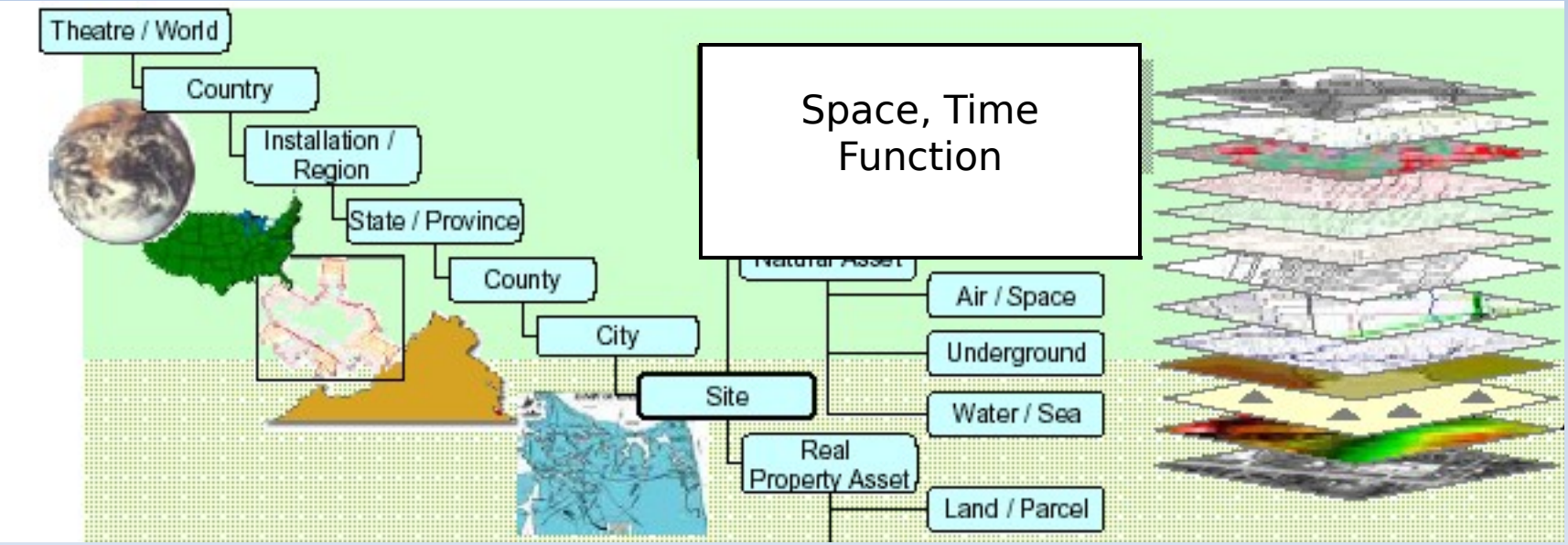


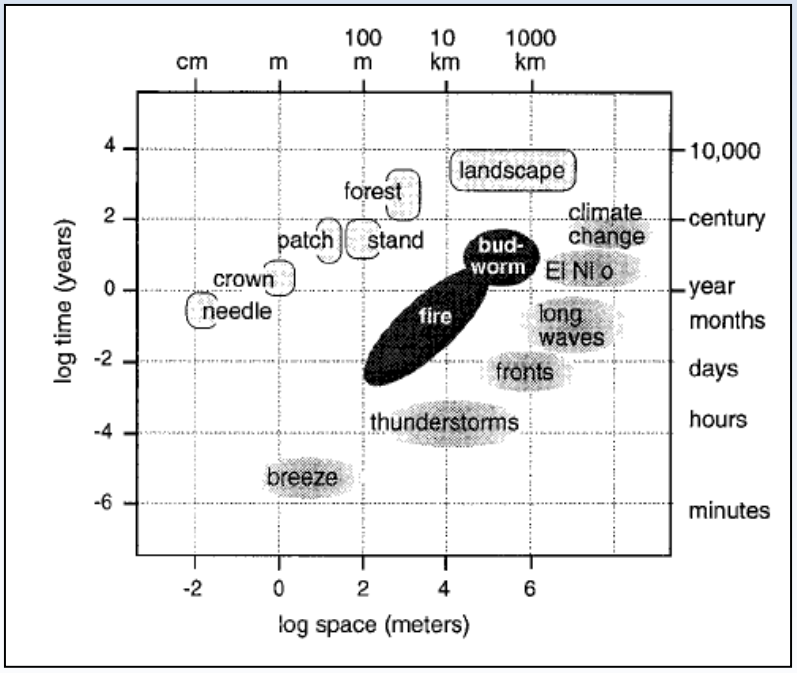
ACTIONS for CHANGE

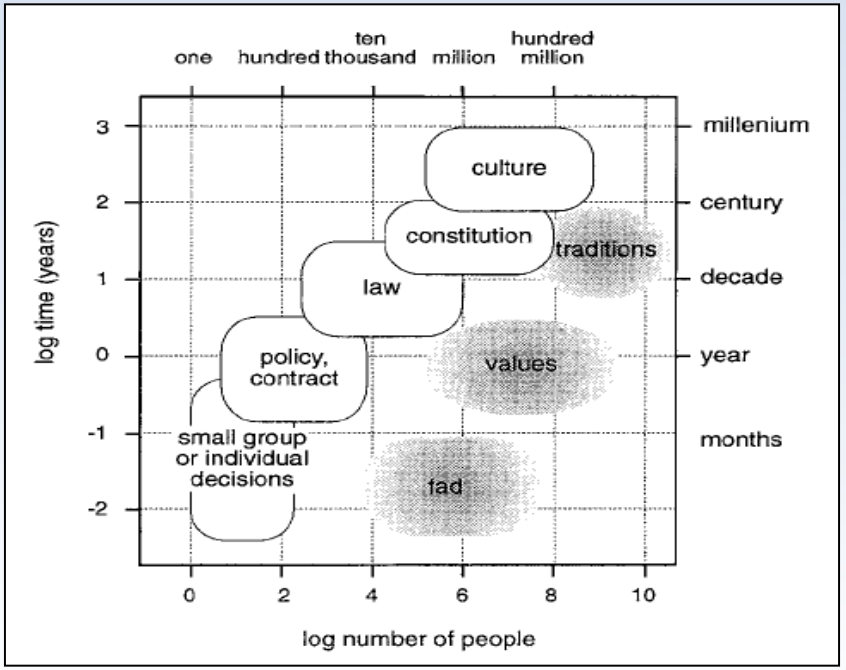
AFC Comprehensive Systems Approach

- **Consider space, function and time**
- **Implement a more holistic approach to water resources**
- **Integrate sponsors, stakeholders, Federal and State agencies**
- **Balance sustainable development & environmental protection**
- **Enhance national, regional & local partnerships**
- **Benefit from standardization and expanded use of spatial data and visualization tools**

ACTIONS for CHANGE







Boreal Forest

Holling 2001: Understanding the Complexity of Economic, Ecological, and Social Systems

Institutional Hierarchy of Rule S

Theme 1 - Project Delivery Teams

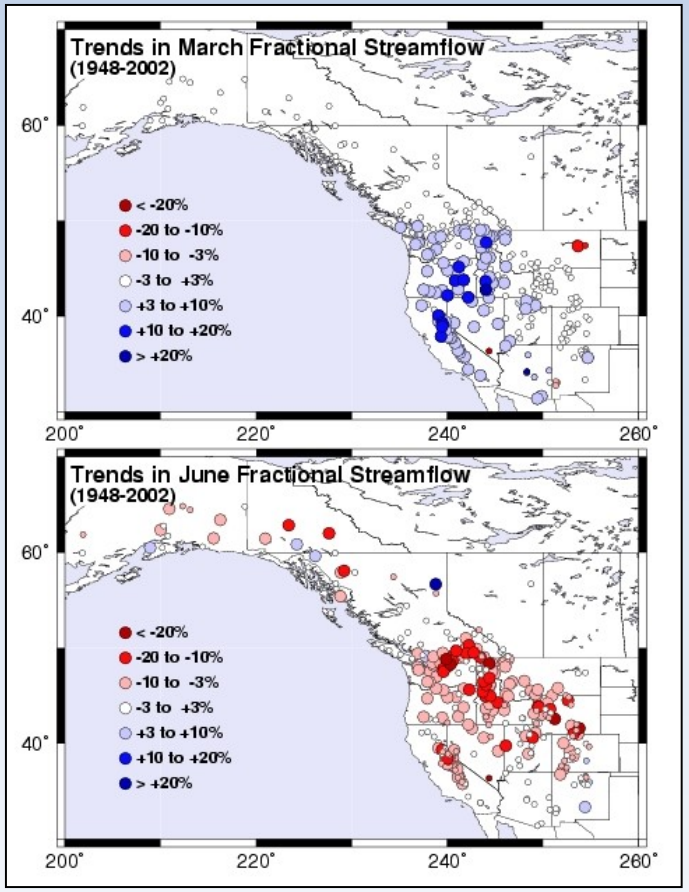
- **Vertical Control**
  - **“Findings of errors [from the IPET Study] of one to three feet in some of the elevations used in design, construction, maintenance, and evaluation of hurricane and flood control structures in New Orleans highlighted the need to** ensure that our flood control and navigation projects across the country are referenced to the proper vertical datums…”
  - **Implement a nationwide datum and subsidence standard for geodetic and water level information within USACE**
  - **POC Jim Garster (ERDC-TEC)**

ACTIONS for CHANGE

Lieutenant General Carl A. Strock, Memorandum For Major Subordinate Commands, December 2006

Theme 1 - Project Delivery Teams

- **Temporal and Spatial System Changes**
  - **American Society of Civil Engineers post-Katrina review panel stressed need to incorporate new and changing information**
  - **Develop guidelines and recommend policy and program changes along with supporting technologies, to address dynamic processes, temporal and spatial changes and their impacts to USACE projects on watershed, regional or system scale (e.g., subsidence, climate change and variability, altered seismicity, sea level change)**
  - **POC Rolf Olsen (IWR)**

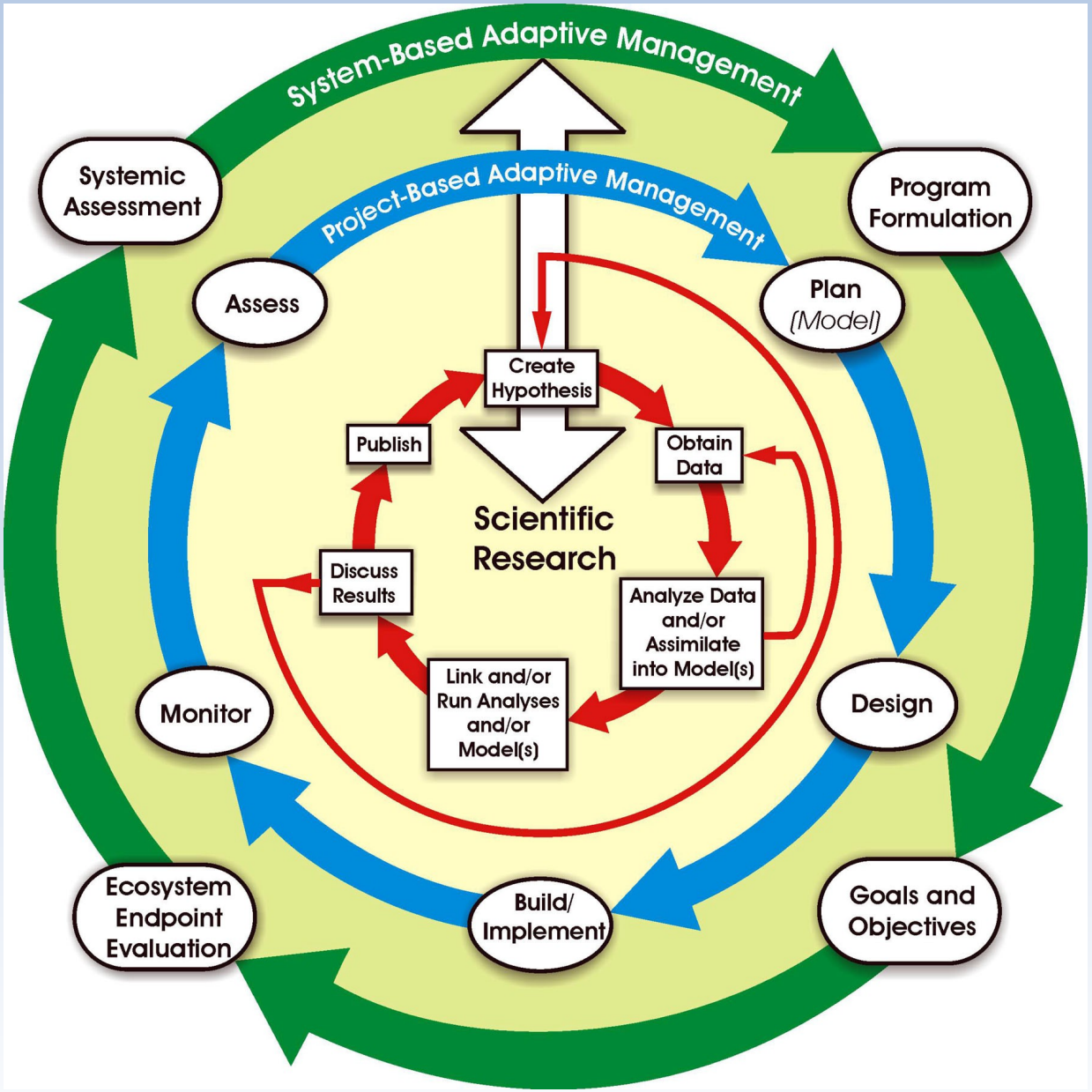


Stewart IT, Cayan DR, Dettinger MD, 2005: Changes toward earlier streamflow timing across western North America, J. Climate, 18 (8): 1136-1155

ACTIONS for CHANGE

Theme 1 - Project Delivery Teams

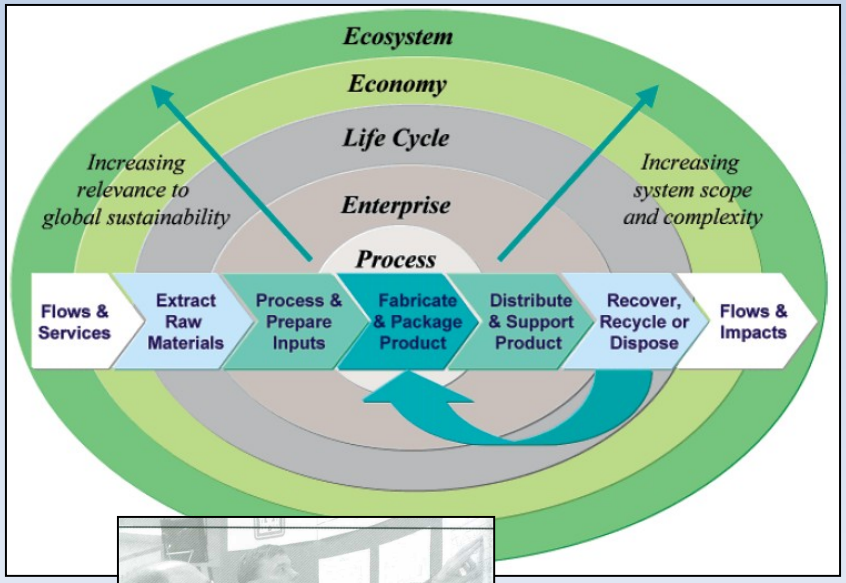
- **Adaptive Management**
  - **Develop a framework for adaptive management that can be incorporated into USACE Civil Works projects to allow for flexible decision making in the face of uncertainty**
  - **Result will be a business process aimed at balancing economic, social, and ecological factors for a sustainable future**
  - **POC Ken Barr (MVR)**



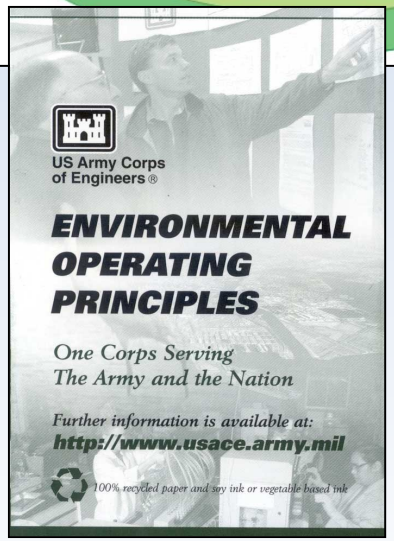
ACTIONS for CHANGE

Theme 1 - Project Delivery Teams

- **Sustainable Solutions**
  - **Balance ecological, economic and social sustainability factors in USACE projects and systems within the framework of the Environmental Operating Principles**
  - **POC Frank Appelfeller (LRD)**



Bakshi, B.; Fiksel, J. The Quest for Sustainability: Challenges for Process Systems Engineering. *AIChE J.* **2003**.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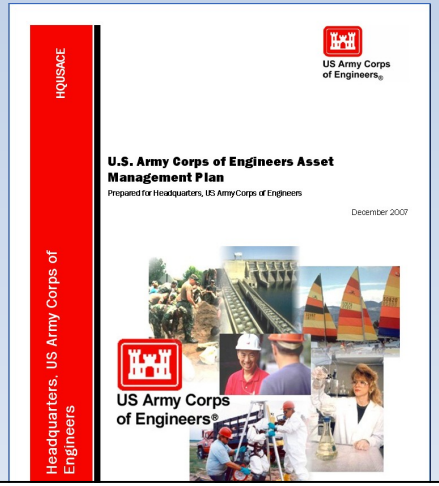
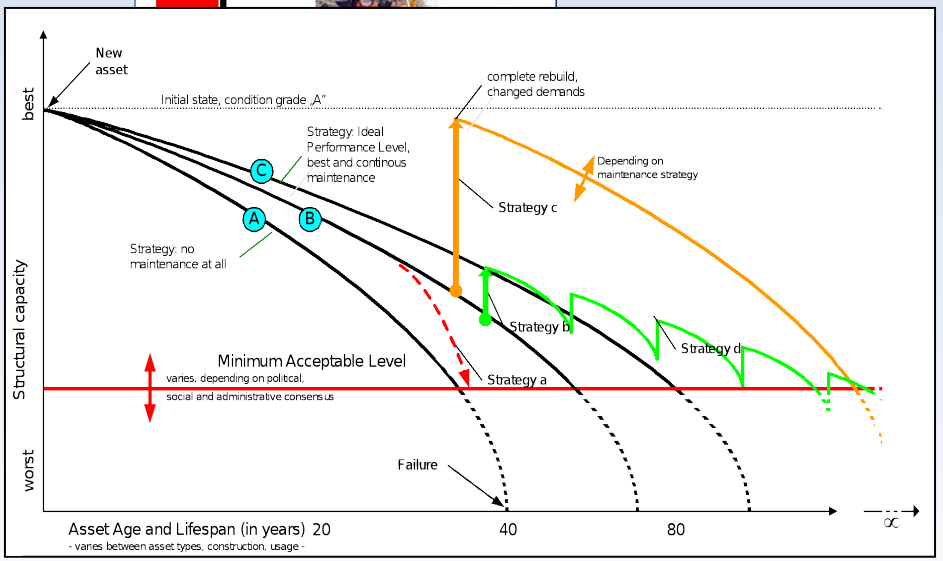
Theme 1 - Project Delivery Teams

- **Post-Construction System Evaluation**
  - **Enhance multi-objective decision making for post-construction evaluation of project outcomes, leveraging enhanced data collection and integrating existing management and geospatial databases.**
  - **Bottom Line: all USACE business lines are users**
  - **POC Jose Sanchez (HQUSACE)**

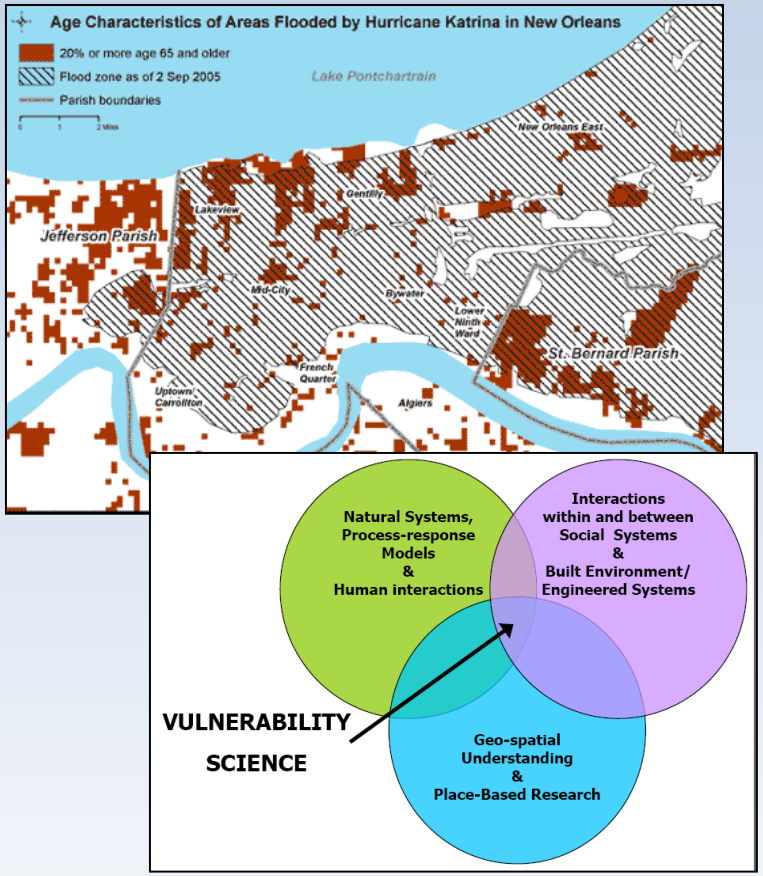

HQUSACE
Headquarters, US Army Corps of Engineers
US Army Corps of Engineers
U.S. Army Corps of Engineers Asset Management Plan
Prepared for Headquarters, US Army Corps of Engineers
December 2007
US Army Corps of Engineers®



ACTIONS for CHANGE

Theme 1 - Project Delivery Teams

- **Multi-Objective System Planning and Policy**
  - **Develop a comprehensive, adaptive, systems approach for multi-objective planning that places the highest priority on protection of public health and safety**
  - **Address unanticipated consequences and impacts to cost sharing**
  - **POC Susan Durden (IWR)**



http://nasadaacs.eos.nasa.gov/articles/2006/2006_hurricanes.html

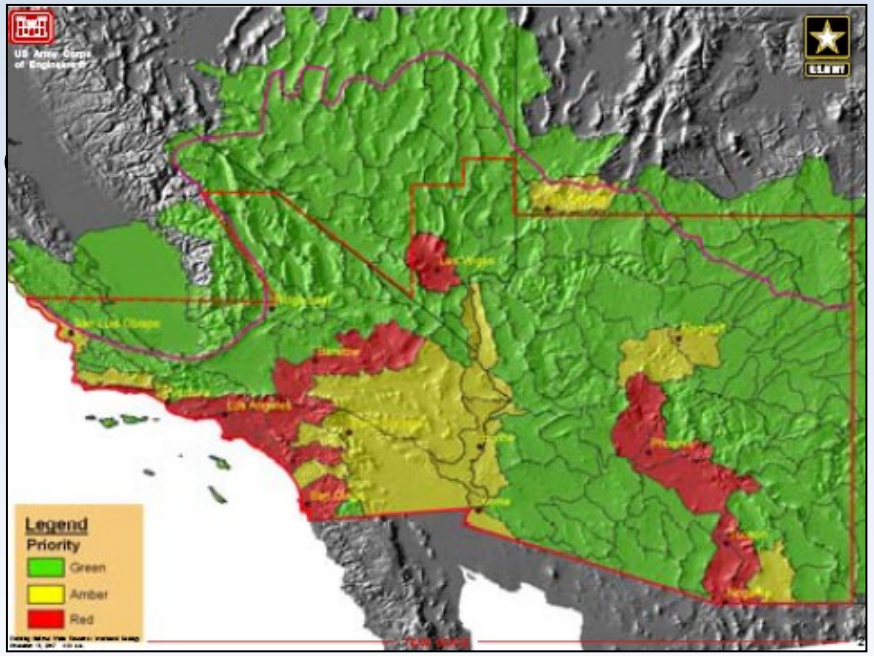
http://www.orau.gov/DHS_RE_Summit07/Presentations/Cutter.pdf

ACTIONS for CHANGE

Theme 1 - Project Delivery Teams

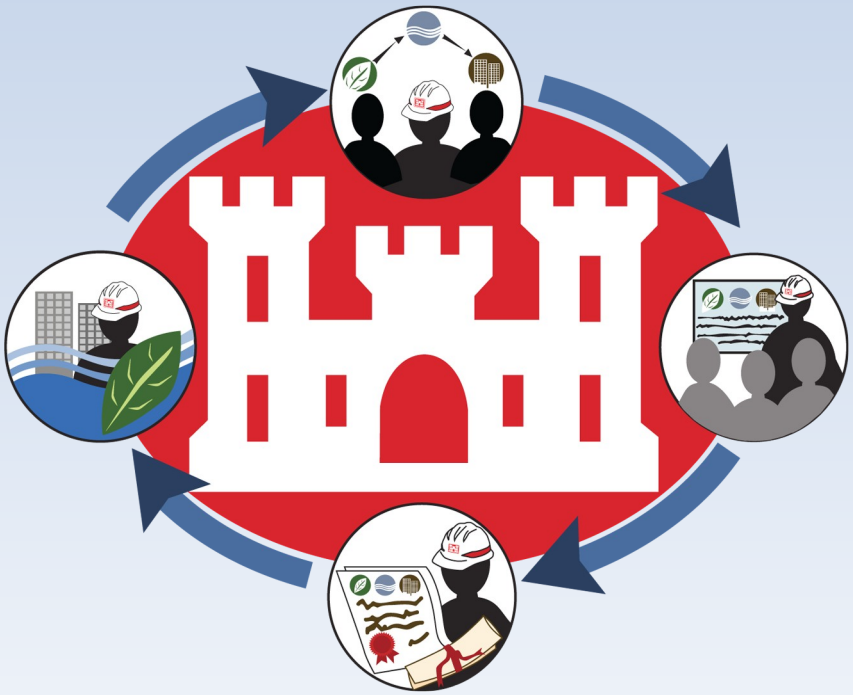
- **Incremental Changes to USACE Systems**
  - **Support comprehensive evaluation capability for incremental changes affecting USACE projects on a watershed and regional basis**
  - **POC Jim Westervelt (ERDC-CERL)**

- **Watershed Investment Decision Mod**
  - **Will include all facets of comprehensive systems approach and other AFC themes**
  - **Support more effective investments while balancing competing demands**



ACTIONS for CHANGE

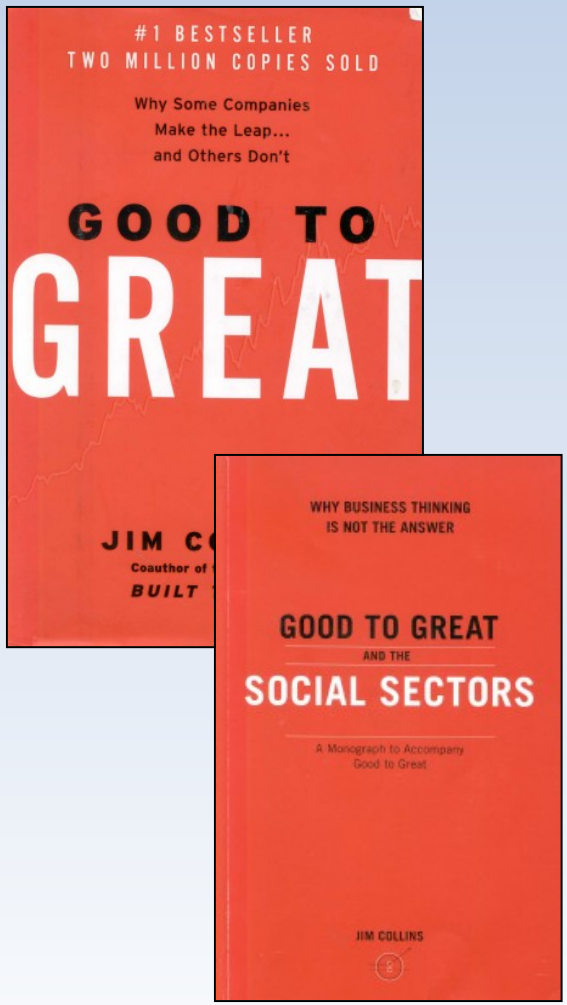
Questions?



To learn more about Actions for Change
visit us on the web at
https://maps.crrel.usace.army.mil/AFC/

ACTIONS for CHANGE

Background Slides



"The fox knows many small things, the hedgehog knows one big thing."

What are we passionate about?

What drives our resource engine?

What can we be best in the world at?

- **No organization can be best in the world at everything**
- **It's not about what we <u>want</u> to be the best at, it's what we <u>can</u> be the best at**

ACTIONS for CHANGE

USACE Emerging Strategic Requirements

- **Broader systems approaches**
- **Consideration of interacting technical, human, organizational and social factors**
- **Risk-based decision support tools and skills**
- **Much broader coalitions and collaboration**
- **Increased public-private partnerships**
- **Anticipatory engineering**
- **Focus on sustainability**

Note on Adaptive Management

"Adaptive management [is a decision process that] promotes flexible decision making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood. Careful monitoring of these outcomes both advances scientific understanding and helps adjust policies or operations as part of an iterative learning process. Adaptive management also recognizes the importance of natural variability in contributing to ecological resilience and productivity. *It is not a 'trial and error' process, but rather emphasizes learning while doing.* Adaptive management does not represent an end in itself, but rather a means to more effective decisions and enhanced benefits."

From DOI Technical Guide (2007) after NRC (2004), emphasis added

ACTIONS for CHANGE